

In the Claims:

1. (currently amended) A method of forming a plate for the passage through [[a]] at least two vertical passages ~~set of apertures~~ of at least one substance from a first location to a second location comprising the steps of:

providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass;

forming at least two sets of vertical passages ~~apertures~~ arranged in a array of sample cells in a first layer, said at least two vertical passages passing completely through said first layer, with each sample cell containing a member of each of said at least two sets of vertical passages ~~apertures~~;

forming corresponding ~~sets of vertical passages~~ apertures connecting to said at least two sets vertical passages in at least one corresponding layer, said corresponding vertical passages passing completely through said corresponding layer;

forming a plurality of set of connecting horizontal channels extending in a horizontal direction ~~apertures~~ in a lower layer disposed below said first and said at least one corresponding layer, in which at least some of said plurality of

horizontal channels ~~apertures~~ in said lower layer connect members of said at least two sets of vertical passages ~~apertures~~; and

sintering ~~assembling~~ said first layer, said at least one corresponding layer and said bottom layer to form a plate containing an array of sample cells containing horizontal and vertical interconnect U-shaped ~~structures~~.

2. (currently amended) A method according to claim 1, in which said lower layer is disposed above a solid layer forming a bottom surface of said horizontal and vertical interconnect U-shaped ~~structure~~.
3. (currently amended) A method according to claim 1, in which said lower layer contains said horizontal channels ~~aperture~~ and also forms a bottom surface of said horizontal and vertical interconnect U-shaped ~~structure~~.
4. (canceled) A method according to claim 1 further comprising a step of: bonding said at least two of said layers together, thereby forming said plate.
5. (canceled) A method according to claim 4, in which said step of bonding said at least two of said layers together, is effected by sintering.
6. (currently amended) A method according to claim 1, in which: said steps of forming horizontal channels and vertical passages ~~apertures~~ in said

at least one of said first, second and third layers are effected by a material removal technique.

7. (currently amended) A method according to claim 1, in which:
said steps of forming horizontal channels and vertical passages ~~apertures~~ in said at least one of said first, second and third layers are effected by a non-material removal technique.

8. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is a removable layer having an upper surface adapted for holding sample materials.

9. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is adapted for passing light.

10. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is transparent.

11. (currently amended) A method according to claim 9, in which said removable layer has a thickness less than 1.0 mm ~~is adapted for high-speed scanning~~.

12. (currently amended) A method according to claim 1, in which at least one of said ~~sets of vertical~~ passages apertures contains removable liners, whereby ~~material adhering to said removable liners may be processed away from said plate.~~
13. (currently amended) A method according to claim 12, in which at least one of said removable liners is selected from a group of materials which is a carrier for a reagent, ~~whereby in operation said reagent reacts with a component of an applied fluid.~~
14. (currently amended) A method according to claim 12, in which at least one of said ~~sets of vertical~~ passages apertures is connected to a space for storing rinsing fluid.
15. (currently amended) A method according to claim 12, in which a material adhering to an inner surface of one of said ~~sets of apertures~~ passages or channels is a carrier for a reagent, whereby in operation said reagent reacts with a substance in an applied fluid.
16. (currently amended) A method according to claim 1, in which said vertical passages apertures and a reaction region of structures of passages apertures are adapted such that bubbles rise to a region outside said reaction region.

17. (currently amended) A method according to claim 1, in which a first one of said ~~sets of vertical passages apertures~~ contains a surface material having a first attraction for capillary action and a second one of said ~~sets of vertical passages apertures~~ contains a surface material having a second attraction for capillary action, ~~whereby different fluids may be selectively inserted into said first and second sets of vertical passages apertures.~~

18. (currently amended) A sample-holding plate containing an array of sample cells for the reaction of reagents in at least two vertical passages ~~a set of apertures~~ comprising:

a plurality of ceramic layers sintered together, said ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass;

at least two sets of vertical passages ~~apertures~~ arranged in said array of sample cells in a first layer, with each sample cell containing a member of each of said at least two sets of vertical passages ~~apertures~~;

at least one corresponding layer containing sets of corresponding vertical passages ~~apertures~~ connecting to said at least two sets of vertical passages ~~apertures~~ in first layer;

a bottom layer disposed below said first and said at least one corresponding layer and containing a plurality set of connecting horizontal channels apertures, in which said ~~set of~~ connecting horizontal channels apertures connect at least some members of said at least two ~~sets of~~ vertical passages apertures, thereby forming an array of sample cells containing horizontal and vertical interconnect U-shaped structures.

19. (currently amended) A sample-holding plate according to claim 18 further comprising a first reagent and a second reagent, in which a first one of said vertical passages apertures comprises a restricted portion capillary retention valve adapted for storing a quantity of [[a]] said first reagent; and a second one of said vertical passages apertures is adapted for receiving [[a]] said second reagent and bringing said second reagent in contact with said first reagent.

20. (original) A sample-holding plate according to claim 19, in which said first and second reagents have quantities such that said first and second reagent overlap by a diffusion length of one of said first and second reagents.

21. (currently amended) A sample-holding plate method according to claim 19, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is a removable layer having an upper surface adapted for holding sample materials.

22. (currently amended) A sample-holding plate method according to claim 18, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is transparent.

23. (currently amended) A sample-holding plate method according to claim 18, in which at least one of said ~~sets of~~ vertical passages ~~apertures~~ is connected to a space for storing rinsing fluid.

24. – 31. (canceled)